Risk Factors of Low Backache in Patients Presenting to A Tertiary Care Hospital of Dera Ismail Khan, Pakistan

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ABSTRACT

Background: Low back pain (LBP) is a leading cause of disability worldwide. The objective of this study was assessment of risk factors of low backache in patients presenting to a tertiary care hospital.
Methods: This cross sectional study was conducted for year 2023 in Department of Orthopedics, DHQ Hospital, . A sample of 180 was calculated. Patients with low backache were selected excluding those with malignancy. Demographic and research variables were noted down using structured questionnaire. Pain, disability and depression was assessed using Numerical Rating Pain Scale (NRS), Quebec Disability Index (QDI) and Patient Health Questionnaire-9 (PHQ-9) respectively.
Results: Out of 180 patients,153(85%) were married & had chronic LBP, 147(81.67%) lacking exercise, 135(75%) used soft sleeping material, 117(65%) had low income & radiating pain, 108(60%) were female, 93(51.66%) patients work 6-12 hours/day, had trauma history & sitting posture, 87(48.33%) had spinal deformity, 84(46.67%) had age <40 years, 81(45%) had moderately active job & high BMI, 75(41.67%) had 1-5 children, 60(33.33%) were uneducated & degenerative spine, 39(21.67%) spinal injection, 24(13.33%) smokers, 21(11.67%) spinal surgery and 15(8.33%) hypertensive. Severe pain was present in 102(56.67%), severe disability in 69(38.33%) and mild depression in 96(53.34%) patients when assessed on NRS, QDI and PHQ-9 scale respectively.
Conclusion: Low backache is caused by many factors. Lack of regular exercise, use of soft sleeping material, in-appropriate sitting posture and high BMI can be addressed by early education of patients and work related ergonomics
Keywords: Sub-acute; Chronic LBP; Disability.

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INTRODUCTION

Background: Low back pain (LBP) is described as pain between the lower edge of the ribs and the buttock. It can be acute (<6weeks),sub-acute (6 to 12 weeks) or chronic (>12weeks) . It makes hard to move and can affect quality of life and mental well-being. Specific LBP is caused by a certain disease or structural problem in the spine, or when the pain radiates from another body part. Non-specific LBP when it is not possible to identify a specific disease or structural reason to explain the pain.[1]

According to recent report of WHO, low back pain (LBP) affected 619 million people globally in year 2020 and their number will increase to 843 million cases by 2050, driven largely by population expansion and ageing. LBP is the leading cause of disability and has highest prevalence globally among musculoskeletal problems. It affects people of any age including children and adolescents at least once in their life.[2] Global Burden of Disease (GBD) 2019 study shows global, regional, and national burdens of LBP from 1990 to 2019 as an estimated 223.5 million

cases of LBP and 63.7 million LBP-related DALYs worldwide (Table 1.1).[3]

Table 1.1: WHO Global and South Asia Regional data for LBP for years 1 990 and 2019.

Incident Cases	1990	2019	DALYs	1 990	2019
Global	149,294, 134	223,455,640	Global	43,361,648	63,685119
South Asia	24,041, 599	38,927,433	South Asia	6,224,377	9,920,979

In 2019, low back pain ranked fourth among top causes of DALYs in the age groups of 10-24 years and 25-49 years. LBP is more prevalent in women. Recurrent LBP episodes are more common with ageing.[4] Characteristics of the individual, poor general health, physical stress on spine and psychological stress are adverse risk factors of LBP while physical exercise and absolute resting time are protective factors.[5] LBP burden is rapidly increasing with ageing population in low and middle income countries like Pakistan where resources are in-adequate to address the problem and the effects will be more extreme. We will discuss various risk factors and their association with LBP in our study.

Research Problems (RPs), Knowledge Gaps (KGs) and Research Questions (RQs): Unawareness of frequency, distribution and association of low backache in population of , Pakistan were our RPs. Unavailability of data on online literature search through various databases regarding these research problems were our KGs. What is the frequency, distribution and association of LBP in population of , Pakistan were our RQs.

Research Objectives (ROs)

The objectives of this study were to determine:

RO1 : The frequency of low backache by duration of pain in population of Pakistan.
RO2: The frequency of types of low backache in population of Pakistan.
RO3: The distribution of low backache by age groups in population of Pakistan.
RO4: The distribution of low backache by gender in population of Pakistan.
RO5: The distribution of low backache by level of education in population of Pakistan.
RO6: The distribution of low backache by working hours per day in population of Pakistan.
RO7: The distribution of low backache by nature of job in population of Pakistan.
RO8: The distribution of low backache by monthly income in population of Pakistan.
RO9: The distribution of low backache by marital status in population of Pakistan.
RO10: The distribution of low backache by no. of children in population of Pakistan.
RO11 : The distribution of low backache by radiation of pain in population of Pakistan.
RO12: The distribution of low backache by radiology in population of Pakistan.
RO13: The distribution of low backache by previous back trauma in population of Pakistan.
RO14: The distribution of low backache by spinal surgery in population of Pakistan.
RO15: The distribution of low backache by spinal injection in population of Pakistan.
RO16: The distribution of low backache by examination findings in population of Pakistan.
RO17: The distribution of low backache by pain rating in population of Pakistan.
RO18: The distribution of low backache by disability in population of Pakistan.
RO19: The association of low backache with BMI in population of Pakistan.
RO20: The association of low backache with smoking in population of Pakistan.
RO21 : The association of low backache with exercise in population of Pakistan.
RO22: The association of low backache with sleeping material in population of Pakistan.
RO23: The association of low backache with posture in population of Pakistan.
RO24: The association of low backache with co-morbidities in population of Pakistan.
RO25: The association of low backache with depression in population of Pakistan.

Significance: This study aims to determine risk factors for LBP, assessment of disability and depression among LBP patients in population of Pakistan for disease prevention as well as further improvements in patients management to reduce morbidity & disability, lifestyle modifications, ongoing exercise & rehabilitation, ergonomic adjustments, and strategies to promote self-management & self-care.

MATERIALS AND METHODS

Study Design, Settings & Duration and approval of Project: This cross sectional study was conducted from Jan 1, 2023 to Dec 31 , 2023 in Department of Orthopedics, DHQ Teaching Hospital, , Pakistan. Approval for this study was taken from Ethical Review Committee of GMC.

Population, Sample Size & Technique and SampleSelection: Population of for year 2023 was 1,627, 132 so a sample of 180 was calculated at 95% Confidence level, 7.27% margin of error and 45% response distribution using Raosoft.[6,7] Non-probability consecutive sampling technique was used.

Inclusion and Exclusion Criteria: All patients with low backache were selected excluding those with malignancy.

Conduct of Procedure: It was hospital based study comprising patients presenting to
OPD. Data collection questionnaire was prepared and selected patients were interviewed after informed consent.

Data Collection & Analysis Plan: Demographic variables (attributes) were: age (upto 40 years, 41 to 60 years & >60 years), gender (male & female), education (uneducated, upto 5th, upto 8th, matric, graduation & higher), working hours/day (upto 6, 6 to 12 & >12 hours), job nature (unemployed, sedentary, mild active, moderately active & very active), monthly income (low, moderate & high), body mass index BMI (low, normal & high), smoking status (yes & no), marital status (yes & no), no. of children (zero, 1 to 5 & >5), radicular-pain (yes & no), exercise (yes & no), radiology (normal, muscle-spasm, degenerative-spine & vertebral collapse), previous back trauma (yes & no), spinal surgery (yes & no), spinal injection (yes & no), sleeping material (soft & hard), posture mostly adopted (sitting, standing, lying & stooping), co-morbidities (DM, HTN, IHD, R.A, Osteoporosis & Dyslipidemia) and examination findings (Hip disease, Deformity & Osteoarthritis knee) were noted down on structured questionnaire. Our research variables (attributes) were: duration (years, months & days) and types of LBP (acute, sub-acute & chronic) . Patient pain status was assessed using Numerical Rating Pain Scale (NRS).[8] For assessment of disability Quebec Disability Index (QDI) and for depression Patient Health Questionnaire-9 (PHQ-9) were used.[9,10] All variables were categorical and were analyzed by count and percentages for sample and by 95% CI for proportion for population using Wilson score interval through online statistical calculator.[11] All data was analysed using SPSS version 29.

RESULTS

Frequency of LBP by duration and types (RO1-2): Out of 180 patients, LBP more than 12 weeks of duration was present in 153(85%) patients showing chronic LBP 153(85%) as common type as shown in table 3.1.

Table 3.1: Frequency of LBP by duration and types in population of , Pakistan (n=1 80)

Research Variables	Attributes	Sample statistics		95% CI for proportion	
		Count	Percentage	Lower	Upper
Duration of Pain	<6 Weeks	1 5	8.33%	5.1 1	1 3.29
	6-1 2 Weeks	12	6.67%	3.85	1 1 .29
	>1 2 Weeks	153	85%	79.06	89.48
Types of LBP	Acute	1 5	8.33%	5.1 1	1 3.29
	Sub-Acute	12	6.67%	3.85	1 1 .29
	Chronic	153	85%	79.06	89.48
Total		180	100%		

Distribution of LBP (RO3-18): Out of 180 patients, 153(85%) were married. Most common risk factors for low backache were low income & radiating pain in 117(65%) patients, 108(60)% were females, 93(51.66%) patients work 6-12 hours per day, 87(48.33%) had history of trauma & spinal deformity, 84(46.67%) had age <40 years, 81(45%) had moderately active job, 75(41.67%) had 1-5 children, 60(33.33%) were uneducated & had degenerative spine, 39(21.67%) had history of spinal injections and 21(11.67%) spinal surgery. Severe pain was present in 102(56.67%) patients on Numeric Rating Pain Scale assessment. Using Quebec disability index, 69(38.33%) patients were classified as having severe disability. (Table 3.2).

3.3 Association of LBP (RO19-25): Out of 180 patients, most common risk factors for low backache were lack of regular exercise in 147(81.67%) patients, 135(75%) were using soft sleeping material, 93(51.66%) had sitting posture mostly

adopted, 81(45%) had high BMI, 24(13.33%) were smokers, 15(8.33%) had hypertension and mild depression was present in 96(53.34%) patients when assessed on PHQ-9 scale as shown in table 3.3.

Table 3.2: Distribution of LBP by demographic variables in population of , Pakistan (n=180)

Demographic Variables	Attributes	Sample statistics		95% CI for proportion	
		Count	Percentage	Lower	Upper
Age	Upto 40 years	84	46.67	39.52	53.95
	41-60 years	72	40	32.12	47.29
	>60 years	24	1 3.33	9.12	19.07
Gender	Male	72	40	32.12	47.29
	Female	1 08	60	52.71	67.88
Education	Uneducated	60	33.33	26.86	40.50
	5th	12	6.67	3.85	11.29
	8th	30	16.67	11.93	22.80
	Matric	24	13.33	9.12	19.07
	Graduation	33	18.33	13.36	24.68
	Higher	21	11 .67	7.75	17.18
Working Hours Per Day	Upto 6 Hours	66	36.67	29.97	43.92
	6-12 Hours	93	51 .66	44.41	58.86
	>12 Hours	21	11 .67	7.75	17.18
Job Nature	None	6	3.34	1.53	7.08
	Sedentary	24	13.33	9.12	19.07
	Mild Active	54	30	23.78	37.06
	Moderately Active	81	45	37.90	52.37
	Very Active	1 5	8.33	5.11	13.29
Income	Low	117	65	57.78	71.59
	Moderate	51	28.33	22.26	35.32
	High	12	6.67	3.85	11.29
Marital Status	Married	153	85	79.06	89.48
	Unmarried	27	15	10.52	20.94
No. of Children	Zero	33	18.33	13.36	24.68
	1-5	75	41.67	34.71	48.97
	>5	72	40	33.12	74.29
Radicular Pain	Yes	63	35	28.41	42.22
	No	117	65	57.78	71.59
Radiology	Normal	48	26.67	20.74	33.57
	Muscle Spasm	27	15	10.52	20.94
	Degenerative Spine	75	41 .67	34.71	48.97
	Vertebral Collapse	30	16.66	11.93	22.80
Previous Back Trauma	Yes	87	48.33	41.14	55.59
	No	93	51.67	44.41	58.86
Spinal Surgery	Yes	21	11.67	7.75	17.18
	No	159	88.33	82.82	92.94
Spinal Injection	Yes	39	21.67	16.27	28.24
	No	141	78.33	71.76	83.73
Examination Findings	None	33	18.33	13.36	24.68
	Hip Disease	12	6.67	3.85	11.29
	Spinal Deformity	87	48.33	41.1 4	55.59
	O.A	48	26.66	20.74	33.57
NRS	Mild	24	13.33	9.12	19.07
	Moderate	54	30	23.78	37.06
	Severe	102	56.67	49.36	63.69
QDI	Mild	6	3.33	1.53	7.08
	Moderate	39	21.67	16.27	28.24
	Severe	69	38.33	31.54	45.67
	Very Severe	57	31.67	25.31	38.78
	Extreme	9	5	2.65	9.22

Total	180	100%	

Table 3.3: Association of LBP in population of , Pakistan (n=1 80)

Variables	Attributes	Sample statistics		95% CI for proportion	
		Count	Percentage	Lower	Upper
BMI (Kg/m^2)	<18.4	30	16.67	11.93	22.80
	Normal	69	38.33	31.54	45.67
	>24.9	81	45	37.91	52.30
Smoking	Yes	24	13.33	9.12	19.07
	No	156	86.67	80.93	90.87
Exercise	Yes	33	18.33	13.36	24.68
	No	147	81 .67	75.37	86.64
Sleeping Materials	Soft	1 35	75	68.20	80.76
	Hard	45	25	19.24	31 .80
Posture	Sitting	93	51.67	44.41	58.86
	Standing	48	26.66	20.74	33.57
	Lying	18	10	6.41	15.25
	Stooping	21	11.67	7.75	17.1 8
Co-Morbidities	DM	6	3.33	1.53	7.08
	HTN	15	8.33	5.11	13.29
	IHD	9	5	2.65	9.22
	R.A	0	0	0	0
	Osteoporosis	12	6.67	3.85	11.29
	Dyslipidemia	3	1.67	0.56	4.78
PHQ-9	None	27	15	10.52	20.94
	Mild	96	53.34	46.05	60.48
	Moderate	24	13.33	9.12	19.07
	Severe	27	15	10.52	20.94
	Very Severe	6	3.33	1.53	7.08
Total		180	100%		

DISCUSSION

Frequency of LBP (RO1-2): In our study, frequency of duration of LBP >12 weeks was 153(85%, 95% CI 79.06-89.48), acute LBP 15(8.33%, 95% CI 5.11-13.29), sub-acute LBP 12(6.67%, 95% CI 3.85-11.29) and chronic LBP 153(85%, 95% CI 79.06-89.48) out of 180 patients. No other study with higher results was found.

However, a study similar to us in Nigeria by Emorinken, et al.[12] among 319 patients showed acute LBP in 39(12.2%) patients, sub-acute LBP in 25(7.8%) patients, & chronic LBP with >12 weeks duration in 255(79.9%) patients and in Pakistan by Zafar, et al.[13] among 375 patients showed chronic LBP 294(78.4%) with results nearly similar to ours.

A study by Abugad, et al.[14] in Saudia Arabia among 102 paint workers showed 63(62.2%) had LBP >12 weeks duration with recurrent episodes and in Pakistan by Afridi, et al.[15] among 348 Bus drivers showed LBP >12 weeks duration in 224(64.4%) patients & by Dawood, et al.[16] on 80 medical doctors showed 68% experiencing chronic LBP which are lower than our study respectively.

Distribution of LBP (RO3-18): In our study, most prevalent risk factors for low backache were age <40 years in 84(46.67%, 95% CI 39.52-53.95) patients, 108(60%, 95% CI 52.71-67.88) patients were female, 60(33.33%, 95% CI 26.86-40.50) were uneducated, 93(51 .66%, 95% CI 44.41-58.86) patients work 6-12 hours/day, 81(45%, 95% CI 37.90-52.37) had moderately active job, 117(65%, 95% CI 57.78-71 .59) had low income, 153(85%, 95% CI 79.06-89.48) patients were married, 75(41 .67%, 95% CI 34.71-48.97) had 1-5 children, 117(65%, 95% CI 57.78-71.59) had radiating pain, 60(33.33%, 95% CI 26.86-40.50) had degenerative spine, 87(48.33%, 95% CI 41.14-55.59) had back trauma history, 39(21.67%, 95% CI 16.27-28.24) had history of spinal injection & 21(11.67%, 95% CI

7.75-17.18) spinal surgery, and 87(48.33%, 95% CI 41.14-55.59) had spinal deformity.

Jia et al. among 57,501 participants showed results of LBP higher than our study in age group <40 years as 50,525(87.9%) and lower in female gender as 20,261(35.2%) & in married status as 35,343(61.5%) than our study. A study similar to us by Zafar, et al. showed 180(48%) patients belong to age group <40 years & 192(51.2%) patients working around 41 –50 hours per week, and by Afridi, et al. showed most frequently affected age group was fourth decade of life 135(38.7%) and 4 to 5 working hours of driving/day in 193(55.5%) drivers with LBP.

Luhur, et al.[17] showed higher results for female gender (71.7%) and similar results to our study for married (80.8%). Ge, et al.[18] among 1,941 patients showed similar to ours result for females 1,082(56.2%) while lower results in age group <40 years 499(29.6%), uneducated 286 (14.2%), and married 1,175(63.5%) than our study. Ben, et al.[19] among 437 secondary-school children showed similar results to ours for females 273(62.5%) while LBP was common in middle income group 393(89.9%) in their study. A study similar to us by Emorinken, et al. showed LBP was more prevalent in females 196(61.4%) . However, higher results for married status 293(91 .8%) & radicular pain 146(45.8%) and lower results for age group <40 years 11(3.4%) & previous back trauma 39(12.2%). Siddiqui, et al.[20] among 300 patients showed similar results to ours for female 185 (61.7 %) and radiating pain in 197 (65.7%). Rafique, et al.[21] among 384 patients showed 56% were female similar to our study. Taha, et al.[22] among 300 medical students showed lower results for females 130(43.3%) than our study.

Abugad, et al. among 102 paint workers showed lower results in uneducated 14.8% than our study.

A study by Mushtaq, et al.[23] among 155 patients showed low income in 90(58%) similar to our study and higher results for uneducated patients 97(62.5%) while LBP was common in age group >40 years in 144(92.9%) patients.

In our study, severe pain was present in 102 (56.67%, 95% CI 49.36-63.69) patients on Numeric Rating Pain Scale assessment. Rafique, et al. reported higher results for severe pain 246(64%) than ours while moderate-intensity pain on Visual Analogue Scale was reported by Afridi, et al. in 1 35(38.8%) bus drivers and Abugad, et al. in 50(49%) paint workers.

In our study, 69(38.33%, 95% CI 31 .54-45.67) patients were classified as having severe disability using Quebec disability index. A study similar to us by Mushtaq, et al. showed 57(36.7%) patients having severe disability on QDI. In comparison to our study, Emorinken, et al. showed moderate disability in 121(44.5%) patients, Rafique, et al. showed minimal disability in 82% and Dawood, et al. showed minimal disability in 89% patients using Oswestry Disability Index.

Association of LBP (RO19-25): In our study, associated risk factors for low backache out of 180 patients were high BMI 81(45%, 95% CI 37.90-52.37), smoking 24(13.33%, 95% CI 9.12-19.07), lack of regular exercise 147(81.67%, 95% CI 75.37-86.64), use of soft sleeping material 135(75%, 95% CI 68.20-80.76), sitting posture mostly adopted 93(51.66%, 95% CI 44.41-58.86) and Hypertension in 15(8.33%, 95% CI 5.11-13.29) patients. Mild depression was present in 96(53.34%, 95% CI 46.05-60.48) patients when assessed on PHQ-9 scale.

A study by Siddiqui , et al. showed higher results for high BMI 224(74.6%) than ours and by Emorinken A, et al. showed higher results for high BMI in 180(56.4%) patients, lower results for prolonged sitting in 62(19.4%) patients and higher results for Hypertension in 95(29.8%) & Diabetes mellitus in 26(8.2%) patients in comparison to our study.A study similar to us by Ben, et al. among 437 secondary-school children showed high BMI in 100(43.1%), by Abugad, et al. showed high BMI in 41(40.2%) while higher results for smoking (38%) and lower results for lack of exercise 42(41%). A study by Rafique, et al. showed lower results for high BMI (27%) while results for smoking (16%) and lack of exercise (77%) were similar to us.

Ge, et al. among 1,941 patients showed higher results for smoking 496(25.6%) and Jia, et al. among 57,501 participants showed higher results for smoking 20,974(36.5%) & lower results for lack of exercise 17,947 (31.2%) than our study while most patients with LBP had normal BMI 39,328(68.4%) in their study. A study by Luhur, et al. showed results for smoking (14.1%) & lack of exercise (84.8%) similar to us while higher results for high BMI (61.6%), and by Taha, et al. showed results for smoking 47(18.5%) similar to us while higher results for sitting position 187(73.6%) & lower results for high BMI 88(29.3%) than ours.

A study by Zafar, et al. showed lack of exercise 286(76.3%) and prolonged sitting 189(50.4%) similar to us while results of soft foam mattress 195(52.0%) were lower and hypertension 121(32.3%) were higher than our study. A study by

Sultana, et al.[24] among 191 nurses showed prevalent risk factors of LBP as physical (poor posture 36.6%), psychological (fatigue 52.4%), and work environment (Lifting a heavy Patient 23.6% & workload 36.6%).

A study by Bae, et al.[25] in Korea showed higher results for hypertension (34.4%) than our study, however, results of osteoarthritis (26.2%) were similar to our study. A study by Brady, et al. in Australia showed effects of weight on LBP as at baseline with BMI ≥25kg/m^2, for every 5kg higher weight, there was a 5% increased risk of LBP over the next 12 years.

A study similar to us by Mushtaq, et al. showed mild depression in 75(48.3%) patients when assessed on PHQ-9 scale while higher results for lack of exercise 136(87.7%) and lower results for used soft sleeping material 82(52.9%) as compared to our study.

CONCLUSION

Low backache is caused by many factors. Risk factors like lack of regular exercise, use of soft sleeping material, in-appropriate sitting posture, high BMI, etc. can be addressed by taking appreciate preventive measures, health education, early detection and intervention, tailored treatment plans for each risk factor, workplace modifications and healthcare resource allocation. In this manner, the healthcare costs associated with treatment, rehabilitation, and lost productivity can be reduced in our country.

LIMITATIONS OF THE STUDY, POTENTIAL BIASES AND CHALLENGES

It was single center study with small sample size and biases due to measurement tools as well as challenges of participant recruitment & ethical considerations.

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SUGGESTION FOR FUTURE RESEARCH

There is need of further investigation to enhance knowledge and improve patient outcomes on multicentric bases. We recommend future research in directions of chronicity of LBP, genetic and biomarkers association, advanced treatment & physiotherapy protocols and healthcare interventions.

Conflict of Interest: None

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